

CLAIMS

1. A base station apparatus comprising:

an estimator that estimates a direction of arrival
of a signal transmitted from each communication terminal
apparatus;

a determiner that determines an assignment order
of a shared channel that is shared by a plurality of
communication terminal apparatuses and assigned on a per
predetermined transmission unit basis, in association
with the direction of arrival; and

a transmitter that forms a directivity for the
direction of arrival and transmits a shared channel signal
to said each communication terminal apparatus in
accordance with the order.

2. The base station apparatus according to claim 1, wherein
said determiner determines a communication terminal
apparatus that transmits a signal that arrives from a
direction for which a difference from a direction of
arrival of a signal transmitted from a communication
terminal apparatus to which the shared channel is assigned
this time is smallest as a communication terminal
apparatus to which the shared channel will be assigned
next time.

3. A base station apparatus comprising:

an estimator that estimates a direction of arrival
of a signal transmitted from each communication terminal

10069572.022702

apparatus;

a determiner that determines an assignment order of a shared channel that is shared by a plurality of communication terminal apparatuses and assigned on a per predetermined transmission unit basis, according to a value calculated from a priority assigned in association with downlink channel quality and a value indicating the direction of arrival; and

a transmitter that forms a directivity for the direction of arrival and transmits a shared channel signal to said each communication terminal apparatus in accordance with the order.

4. A base station apparatus comprising:

an estimator that estimates a direction of arrival of a signal transmitted from each communication terminal apparatus;

a determiner that determines an assignment order of a shared channel that is shared by a plurality of communication terminal apparatuses and assigned on a per predetermined transmission unit basis, in association with downlink channel quality; and

a transmitter that forms a directivity for the direction of arrival and, prior to a start of transmission of a shared channel signal transmitted to said each communication terminal apparatus in accordance with the order, transmits a dummy signal whose transmission power is increased gradually up to a predetermined transmission

1006572-022702

power value of the shared channel signal.

5. A base station apparatus comprising:

an estimator that estimates a direction of arrival
5 of a signal transmitted from each communication terminal
apparatus;

a determiner that determines an assignment order
of a shared channel that is shared by a plurality of
communication terminal apparatuses and assigned on a per
10 predetermined transmission unit basis, in association
with downlink channel quality;

a transmitter that forms a directivity for the
direction of arrival and transmits a shared channel signal
to said each communication terminal apparatus in
15 accordance with the order; and

a transmission power controller that increases
transmission power of a dedicated channel signal
transmitted to a communication terminal apparatus that
exists in the vicinity of a communication terminal
20 apparatus to which the shared channel signal is
transmitted by a predetermined amount during transmission
of the shared channel signal.

6. A base station apparatus comprising:

25 an estimator that estimates a direction of arrival
of a signal transmitted from each communication terminal
apparatus;

a determiner that determines an assignment order

10069572.022702

of a shared channel that is shared by a plurality of communication terminal apparatuses and assigned on a per predetermined transmission unit basis, in association with downlink channel quality;

5 a transmitter that forms a directivity for the direction of arrival and transmits a shared channel signal to said each communication terminal apparatus in accordance with the order;

10 a notifier that, prior to a start of transmission of the shared channel signal, notifies a communication terminal that exists in the vicinity of a communication terminal apparatus to which the shared channel signal is transmitted of the fact that transmission of the shared channel signal is to start; and

15 a transmission power controller that increases transmission power of a dedicated channel signal to said communication terminal apparatus that exists in the vicinity in accordance with a request from said communication terminal apparatus that exists in the
20 vicinity.

7. A communication terminal apparatus that performs radio communication with the base station apparatus according to claim 6, said communication terminal apparatus
25 comprising:

a detector that detects that the fact that the shared channel signal transmission is to start has been notified from said base station apparatus; and

10069572.022702

a transmitter that, when it is determined that reception quality of the dedicated channel signal will deteriorate beyond a predetermined desired quality due to a start of transmission of the shared channel signal, transmits to said base station apparatus a request signal requesting that transmission power of the dedicated channel signal be increased.

8. A base station apparatus comprising:

an estimator that estimates a direction of arrival of a signal transmitted from each communication terminal apparatus;

a determiner that determines an assignment order of a shared channel that is shared by a plurality of communication terminal apparatuses and assigned on a per predetermined transmission unit basis, in association with downlink channel quality, and also sets a group that includes at least one communication terminal apparatus in association with the direction of arrival; and

a transmitter that forms a directivity for each the group, and using the directivity transmits a shared channel signal in accordance with the order to all communication terminal apparatuses included in the group.

9. A radio communication method comprising:

an estimating step of estimating a direction of arrival of a signal transmitted from each communication terminal apparatus;

10069572.022702

a determining step of determining an assignment order of a shared channel that is shared by a plurality of communication terminal apparatuses and assigned on a per predetermined transmission unit basis, in association with the direction of arrival; and

a transmitting step of forming a directivity for the direction of arrival and transmitting a shared channel signal to said each communication terminal apparatus in accordance with the order.

10 10. The radio communication method according to claim 9, wherein said determining step determines a communication terminal apparatus that transmits a signal that arrives from a direction for which a difference from a direction of arrival of a signal transmitted from a communication terminal apparatus to which the shared channel is assigned this time is smallest as a communication terminal apparatus to which the shared channel will be assigned next time.

20 11. A radio communication method comprising:

an estimating step of estimating a direction of arrival of a signal transmitted from each communication terminal apparatus;

25 a determining step of determining an assignment order of a shared channel that is shared by a plurality of communication terminal apparatuses and assigned on a per predetermined transmission unit basis, according

10069572.022702

to a value calculated from a priority assigned in association with downlink channel quality and a value indicating the direction of arrival; and

a transmitting step of forming a directivity for the direction of arrival and transmitting a shared channel signal to said each communication terminal apparatus in accordance with the order.

12. A radio communication method comprising:

an estimating step of estimating a direction of arrival of a signal transmitted from each communication terminal apparatus;

a determining step of determining an assignment order of a shared channel that is shared by a plurality of communication terminal apparatuses and assigned on a per predetermined transmission unit basis, in association with downlink channel quality; and

a transmitting step of forming a directivity for the direction of arrival and, prior to a start of transmission of a shared channel signal transmitted to said each communication terminal apparatus in accordance with the order, transmitting a dummy signal whose transmission power is increased gradually up to a predetermined transmission power value of the shared channel signal.

13. A radio communication method comprising:

an estimating step of estimating a direction of

1006572.022702

arrival of a signal transmitted from each communication terminal apparatus;

a determining step of determining an assignment order of a shared channel that is shared by a plurality of communication terminal apparatuses and assigned on a per predetermined transmission unit basis, in association with downlink channel quality;

a transmitting step of forming a directivity for the direction of arrival and transmitting a shared channel signal to said each communication terminal apparatus in accordance with the order; and

a transmission power controlling step of increasing transmission power of a dedicated channel signal transmitted to a communication terminal apparatus that exists in the vicinity of a communication terminal apparatus to which the shared channel signal is transmitted by a predetermined amount during transmission of the shared channel signal.

14. A radio communication method comprising:

an estimating step of estimating a direction of arrival of a signal transmitted from each communication terminal apparatus;

a determining step of determining an assignment order of a shared channel that is shared by a plurality of communication terminal apparatuses and assigned on a per predetermined transmission unit basis, in association with downlink channel quality;

10069572.022702

a transmitting step of forming a directivity for the direction of arrival and transmitting a shared channel signal to said each communication terminal apparatus in accordance with the order;

- 5 a notifying step of, prior to a start of transmission of the shared channel signal, notifying a communication terminal that exists in the vicinity of a communication terminal apparatus to which the shared channel signal is transmitted of the fact that transmission of the shared
10 channel signal is to start; and

- a transmission power controlling step of increasing transmission power of a dedicated channel signal to said communication terminal apparatus that exists in the vicinity in accordance with a request from said
15 communication terminal apparatus that exists in the vicinity.

15. The radio communication method according to claim 14, further comprising:

- 20 a detecting step of detecting that the fact that the shared channel signal transmission is to start has been notified from said base station apparatus; and

- a transmitting step of, when it is determined that reception quality of the dedicated channel signal will
25 deteriorate beyond a predetermined desired quality due to a start of transmission of the shared channel signal, transmitting to said base station apparatus a request signal requesting that transmission power of the

dedicated channel signal be increased.

16. A radio communication method comprising:

an estimating step of estimating a direction of
5 arrival of a signal transmitted from each communication
terminal apparatus;

a determining step of determining an assignment
order of a shared channel that is shared by a plurality
of communication terminal apparatuses and assigned on
10 a per predetermined transmission unit basis, in
association with downlink channel quality, and also
setting a group that includes at least one communication
terminal apparatus in association with the direction of
arrival; and

15 a transmitting step of forming a directivity for
each the group, and, using the directivity, transmitting
a shared channel signal in accordance with the order to
all communication terminal apparatuses included in the
group.

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